One-jump simulations

Binseginf

Oct 13th, 2016

Objective

- From one-jump generated data, make QQ plots of conditional power (no stopping rule)

Simulation

Generate data from:

$$n = 12$$

$$y \in \mathbb{R}^n$$

$$\theta = (\underbrace{0, \cdots, 0}_{n/2}, \underbrace{\delta, \cdots, \delta}_{})^n \in \mathbb{R}^n$$

We will consider signal size $\delta = 0, 1, 2, 3, 4$.

Basic sanity checks:

All $Gy \geq 0$

```
library(binSegInf)
```

```
## Loading required package: Matrix
```

```
## Loading required package: pryr
```

```
## Loading required package: testthat
```

```
print(search())
```

```
##  [1] ".GlobalEnv"        "package:binSegInf" "package:testthat"
##  [4] "package:pryr"      "package:Matrix"    "package:stats"
##  [7] "package:graphics"  "package:grDevices" "package:utils"
## [10] "package:datasets"  "package:colorout"  "Autoloads"
## [13] "package:base"
```

```
ip <- as.data.frame(installed.packages()[,c(1,3:4)])
rownames(ip) <- NULL
ip <- ip[is.na(ip$Priority),1:2,drop=FALSE]
print(ip, row.names=FALSE)
```

```
##             Package     Version
##               abind       1.4-3
##             acepack     1.3-3.3
##                 acs         1.2
##                 ada       2.0-3
##              adabag         4.1
##                ade4       1.7-2
##                 ape         3.3
##                 arm       1.8-6
##          assertthat         0.1
##                  BH    1.58.0-1
##           binseginf  0.0.0.9000
##           binSegInf  0.0.0.9000
##              bitops       1.0-6
##               books  0.0.0.9000
##                brew       1.0-6
##                 car       2.1-0
##               caret      6.0-62
##             caTools      1.17.1
##           cghFLasso       0.2-1
##         changepoint       2.2.1
##               chron      2.3-47
##                coda      0.18-1
##            colorout       1.1-1
##          colorspace       1.2-6
##              crayon       1.3.1
##            cubature       1.1-2
##                curl       0.9.6
##             cvTools       0.3.2
##                DAAG        1.22
##          data.table       1.9.6
##           data.tree       0.3.5
##                 DBI       0.3.1
##            DEoptimR       1.0-4
##            devtools      1.10.0
##          DiagrammeR       0.8.2
##           dichromat       2.0-0
##              digest       0.6.9
##                doMC       1.3.3
##          doParallel       1.0.8
##               dplyr       0.4.3
##                e1071       1.6-7
##             effects       3.1-1
##             epicalc    2.15.1.0
##            evaluate         0.8
##              fields       8.2-1
##                 FNN         1.1
##             foreach       1.4.2
##            forecast         7.0
##             formatR         1.1
##             Formula       1.2-0
##            fracdiff       1.4-2
##                 fts       0.9.9
##                 gam        1.12
```

```
##                gap      1.1-16
##              gdata      2.13.3
##           genlasso         1.3
##               geoR     1.7-5.1
##            ggplot2       2.1.0
##              git2r      0.14.0
##             glmgen       0.0.3
##             glmnet       2.0-5
##            gmodels      2.16.2
##                gmp      0.5-12
##             gpclib       1.5-5
##               gptk        1.08
##           gridBase       0.4-7
##           grplasso       0.4-5
##             grpreg       3.0-2
##             gtable       0.1.2
##             gtools       3.4.1
##             hexbin      1.27.1
##              highr       0.4.1
##              Hmisc      3.15-0
##          htmltools       0.3.5
##         htmlwidgets         0.6
##                httr       1.1.0
##              igraph       1.0.1
##              inline      0.3.13
##           intervals      0.15.1
##               irlba       1.0.3
##           iterators       1.0.7
##                 its       1.1.8
##            jsonlite      0.9.17
##             kernlab      0.9-20
##               knitr        1.13
##            labeling         0.3
##                lars         1.2
##        latticeExtra      0.6-26
##            lazyeval      0.1.10
##                lme4      1.1-10
##              locfit     1.5-9.1
##             lpSolve      5.6.11
##           lubridate       1.5.6
##           magrittr         1.5
##          manipulate   0.98.1103
##                maps     3.0.0-2
##            maptools      0.8-37
##            markdown       0.7.4
##        MatrixModels       0.4-1
##         matrixStats      0.15.0
##             memoise       0.2.1
##                mime         0.3
##               minqa       1.2.4
##              misc3d       0.8-4
##            mixtools       1.0.2
##             mlbench       2.1-1
##             mondate  0.10.01.02
```

```
##            multcomp       1.4-4
##             munsell       0.4.2
##            mvtnorm       1.0-5
##              ncdf4        1.13
##             nloptr       1.0.4
##                NMF      0.20.6
##                 np      0.60-2
##            numDeriv    2014.2-1
##             openssl       0.9.1
##            pbkrtest       0.4-2
##            pkgmaker        0.22
##              plot3D       1.0-2
##                plyr       1.8.4
##                 png       0.1-7
##            polypath         1.0
##              pracma       1.8.3
##              praise       1.0.0
##               proto      0.3-10
##                pryr       0.1.2
##                 pwr       1.1-3
##            quadprog       1.5-5
##            quantreg        5.19
##                  R6       2.1.1
##        RandomFields       3.1.1
##   RandomFieldsUtils      0.0.10
##        randomForest      4.6-12
##              raster      2.4-20
##        RColorBrewer       1.1-2
##                Rcpp      0.12.5
##       RcppArmadillo 0.6.600.4.0
##           RcppEigen   0.3.2.5.1
##             readODS         1.4
##            registry         0.3
##             reshape       0.8.5
##            reshape2       1.4.1
##               rgeos      0.3-13
##               rjson      0.2.15
##               rlist     0.4.6.1
##           rmarkdown       0.8.1
##            R.matlab       3.2.0
##         R.methodsS3       1.7.0
##               Rmpfr       0.5-7
##             RNetCDF       1.7-3
##            rngtools       1.2.4
##          robustbase      0.92-5
##                R.oo      1.19.0
##            roxygen2  5.0.1.9000
##             RSQLite       1.0.0
##             rstudio   0.98.1103
##          rstudioapi       0.3.1
##             R.utils       2.1.0
##            sandwich       2.3-4
##              scales       0.4.0
##       scatterplot3d      0.3-37
```

```
##           segmented     0.5-1.1
##  selectiveInference       1.2.0
##            setwidth       1.0-4
##                  sm     2.2-5.4
##                  sp       1.2-0
##                spam       1.0-1
##             SparseM         1.7
##             splancs     2.01-37
##               stepR       1.0-4
##          stringdist     0.9.4.1
##             stringi       1.1.1
##             stringr       1.0.0
##         strucchange       1.5-1
##            testthat       1.0.2
##             TH.data       1.0-7
##            timeDate    3012.100
##          timeSeries    3022.101
##                 tis        1.30
##             tseries     0.10-34
##                urca       1.2-9
##        UScensus2010         0.6
##     UScensus2010blk        1.00
##  UScensus2010blkgrp        1.00
##     UScensus2010cdp        1.00
##  UScensus2010county        1.00
##   UScensus2010tract        1.00
##              vimcom      0.9-93
##             vioplot         0.2
##          visNetwork       0.2.1
##          wavethresh       4.6.6
##                 wbs         1.3
##             weights        0.80
##             whisker       0.3-2
##               withr       1.0.1
##                 XML    3.98-1.3
##                xml2       0.1.2
##              xtable       1.7-4
##                 xts       0.9-7
##                yaml      2.1.13
##             zipcode         1.0
##                 zoo      1.7-12
```

```
## Simulation settings
n = 12
numsteps = n - 1
nsim = 100
sigma = 0.5

## Confirm p-values
p = rep(NA,nsim)
for(isim in 1:nsim){
    y = rnorm(n,0,sigma)
    ## a = binSegInf::binseg.by.size(y, numsteps, verbose=TRUE)
    ## print(all(a$G%*%y>0))
```

```
}
```